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## Conformation of star-like molecular brushes with amphiphilic diblock copolymer side arms

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The core-shell micelles formed by weakly amphiphilic diblock copolymers from poly(2-oxazoline)s (POx) have been shown to be efficient drug carriers [1]. The water solubility of POx is controlled by the nature of the side groups. In the present work, we investigate POx-based molecular brushes, in which diblock copolymers from hydrophilic poly(2-methyl-2-oxazoline) (PMeOx) and weakly hydrophobic poly(2-n-butyl-2-oxazoline) (PnBuOx) are grafted onto backbones which are star polymers from poly(methyl methacrylate) having functionalities ranging from 2 to 5. The size and shape of the star brushes were investigated in dilute aqueous solution using synchrotron small-angle X-ray scattering (SAXS). We find that all SAXS data can be modeled by the form factor of homogeneous ellipsoids, potentially due to the low X-ray contrast between PMeOx and PnBuOx. Their sizes do not depend on the functionality of the stars, hence, it is not a key factor for the star brush conformation. Also, large aggregates (> 100 nm) are observed for all star brushes even in dilute solutions.

[1] A. Schulz, C. M. Papadakis, R. Jordan et al., ACS Nano 2014, 8, 2686.

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